Rural Electrification Administration --- The Rural Electrification Administration (REA) is a credit agency of the U.S. Department of Agriculture that assists rural electric and telephone utilities in obtaining financing The assistance includes direct and Federal Financing Bank (FFB) funded loans and shared security arrangements that permit REA's borrowers to obtain financing from other lenders without a guarantee.

The REA was established by Executive Order 7037 of May 11, 1935, as part of a general program of unemployment relief. It was given statutory authority by the Rural Electrification Act of 1936, as amended (7 U.S.C. 901-9506). Its Administrator is appointed by the President with the advice and consent of the Senate.

Server -- A computer that shares its resources, such as printers and files, with other computers on the network. An example of this is a network file system (NFS) server which shares its disk space with other computers.

SLIP --- SLIP is an older protocol similar to PPP. Both are available as free software at many Internet sites. They are tricky to configure and use, however.

T1 Line --- A digital communications facility developed by AT&T for signals operating at 1.544 mbps, or 1,544,000 bits per second. This is comparable to a 4-lane expressway on the Information Superhighway.

TCP/IP --- Transmission Control Protocol/Internet Protocol is a set of protocols, resulting from ARPA efforts, used by the Internet to support services such as remote login (telnet), file transfer (FTP) and mail (SMTP).

Terminal Emulation Software --- This is software which allows microcomputers to emulate different terminal types. Different terminal emulations are often incorporated into more standard communication packages.

Token Passing --- In communications, token passing is a network access method that uses a continuously repeating frame (the token) that is transmitted onto the network by the controlling computer. When a terminal or computer wants to send a message on the network, it waits for an empty token. When it finds one, it fills it with the address of the destination station and some or all of its message.

Every computer and terminal on the network constantly monitors all the passing tokens to determine if it is a recipient of a message from another device. If it is, it "grabs" the message and resets the token to empty status. Token passing is used in bus-type and ring-type networks.

Token Ring Network --- A token ring network is a communications network that uses the token passing (see Token Passing) technology in a sequential manner. Each station in the network passes the token on to the station next to it.

Wide Area Network (WAN) --- A network spanning hundreds or thousands of miles.

World Wide Web --- a wide-area hypermedia information retrieval initiative designed to give universal access to a large universe of documents. The World-Wide Web began in March 1989 at a laboratory known as CERN, a collective of European high-energy physics researchers. The World-Wide Web (WWW, W3) project was used as a means of transporting research and ideas effectively throughout the organization and provides users on computer networks with a consistent means to access a variety of media in a simplified fashion. The protocol spoken by WWW is http, or hypertext transfer protocol. Using a combination of uniform resource locators (URL's), Hypertext Markup Language (HTML), and sophisticated gateway techniques, the Web can serve up compound documents including text and non-text. Currently, access is provided most often through a popular software interface called Mosaic..

LIBRARIES IN MICHIGAN

Michigan Academic Libraries

3 Major Research Universities
13 Four-Year Universities
30 Community Colleges
12 Post-Baccalaureate Independent Institutions
52 Two/Four Year Independent Institutions
110 Academic Institutions

(each institution assumed to have at least one library)

School Libraries and Media Centers

3500 approximately in Michigan

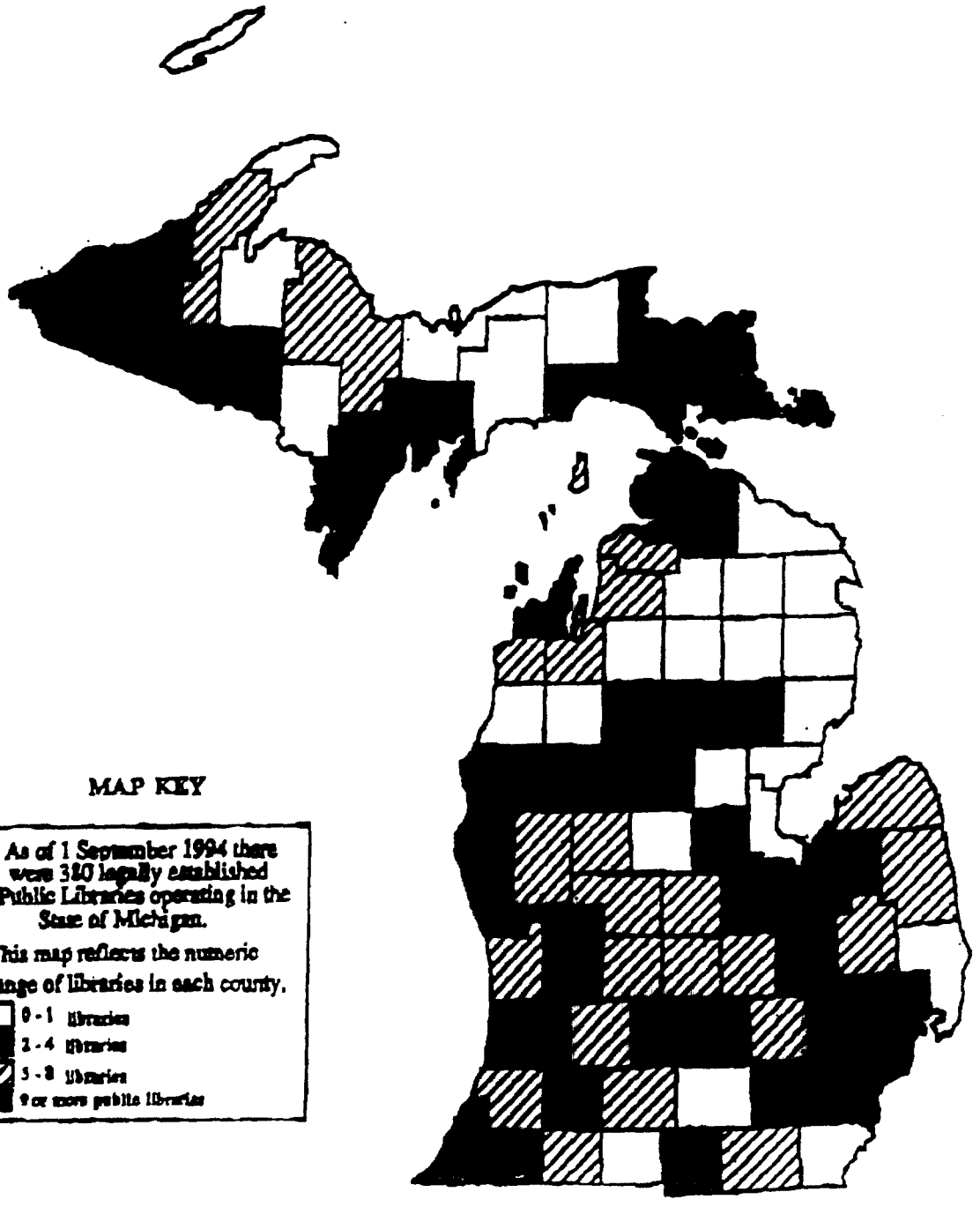
Michigan Public Libraries

380 Administrative Entities and Libraries
plus 242 branches

For Public Libraries serving the following population groups:

	Population Range	*No. of Public Libraries Established*	*Libraries Reported*
Group 1	0 - 3,999	84	83
Group 2	4,000-6,999	76	75
Group 3	7,000-11,999	85	85
Group 4	12,000-25,999	59	59
Group 5	26,000-49,999	31	31
Group 6	50,000 or over	42	42
	Total	377	375

Michigan Public Libraries
County Distribution



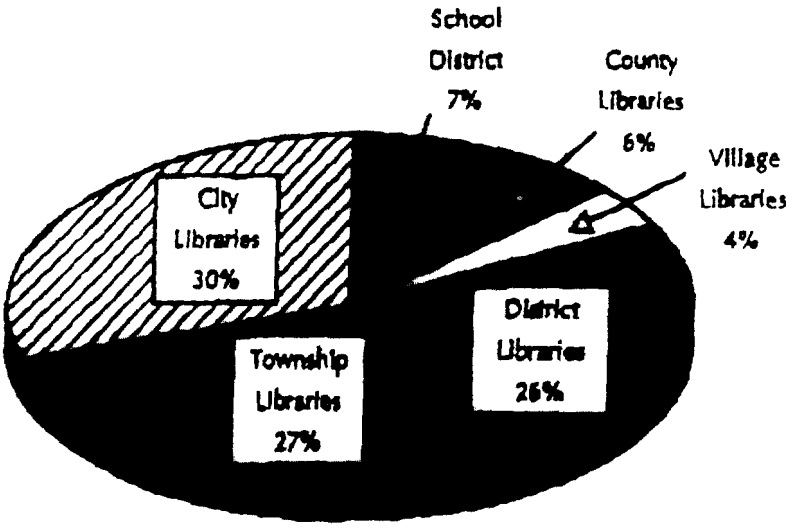
MAP KEY

As of 1 September 1994 there were 320 legally established Public Libraries operating in the State of Michigan.

This map reflects the numeric range of libraries in each county.

- 0 - 1 libraries
- 2 - 4 libraries
- 5 - 8 libraries
- 9 or more public libraries

Types of Public Libraries



Established as of September 1, 1994

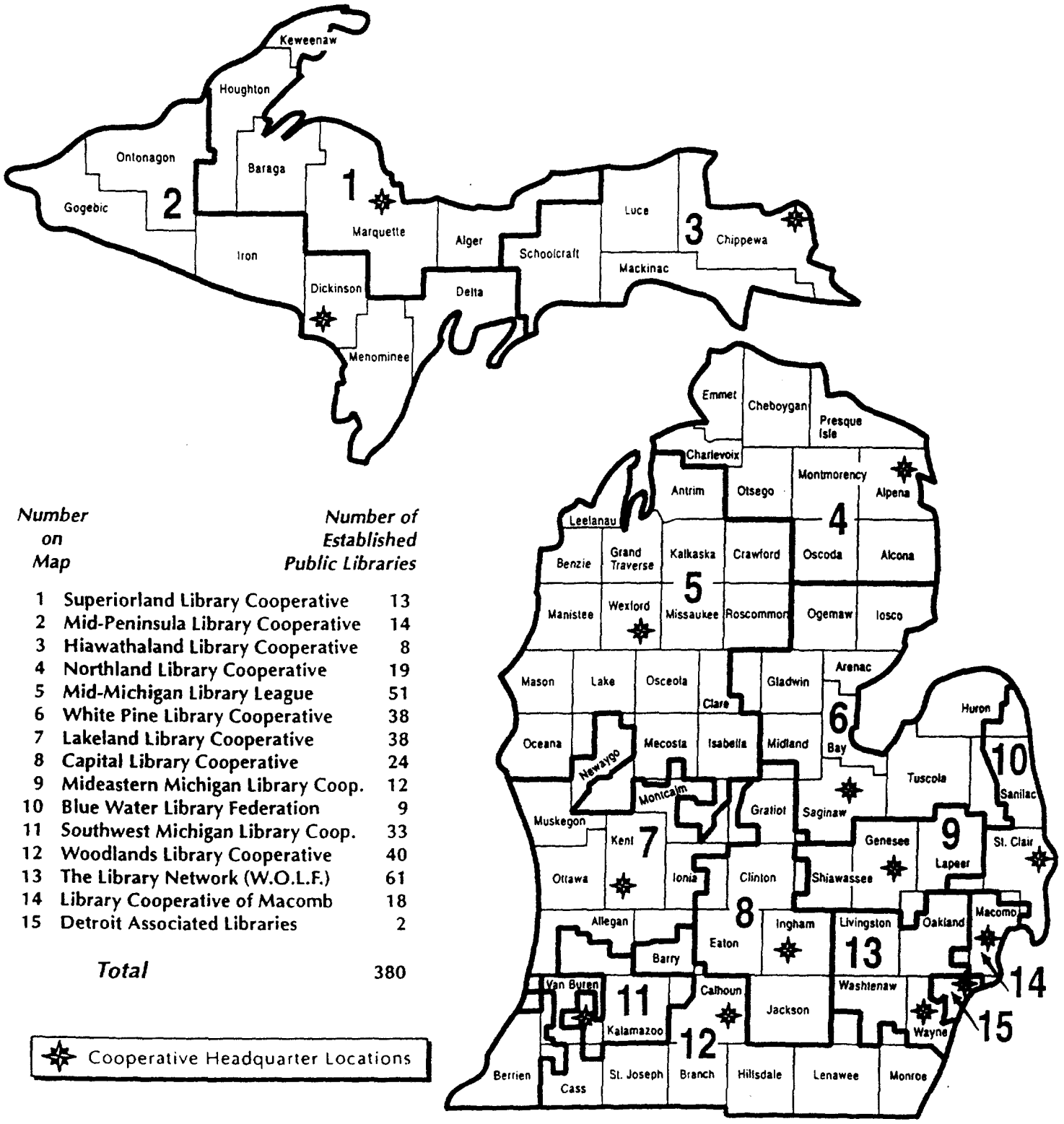
Types of Public Libraries

	1994
City	113
Township	100
District	100
School District	26
County	24
Village	17
Total	**380**

Library of Michigan

Michigan's Public Library Cooperatives

As of November 1994



Number on Map		*Number of Established Public Libraries*
1	Superiorland Library Cooperative	13
2	Mid-Peninsula Library Cooperative	14
3	Hiawathaland Library Cooperative	8
4	Northland Library Cooperative	19
5	Mid-Michigan Library League	51
6	White Pine Library Cooperative	38
7	Lakeland Library Cooperative	38
8	Capital Library Cooperative	24
9	Mideastern Michigan Library Coop.	12
10	Blue Water Library Federation	9
11	Southwest Michigan Library Coop.	33
12	Woodlands Library Cooperative	40
13	The Library Network (W.O.L.F.)	61
14	Library Cooperative of Macomb	18
15	Detroit Associated Libraries	2
	Total	380

Cooperative Headquarter Locations

Michigan's Public Library Cooperatives

As of November 1994

BLUE WATER LIBRARY FEDERATION
210 McMorran Boulevard
Port Huron, MI 48060-4098
Harry P. Wu
810-987-7323
FAX: 810-987-7327
Marianne Kemp, Fax Contact

CAPITAL LIBRARY COOPERATIVE
706 Curtis Street
Mason, MI 48854
Richard A. Douglass
517-676-2147
FAX: 517-676-9646
Verna Parkinson, Fax Contact

DETROIT ASSOCIATED LIBRARIES
5201 Woodward Avenue
Detroit, MI 48202
Jean T. Curtis
313-833-3997
FAX: 313-833-5039

HIAWATHALAND LIBRARY COOPERATIVE
541 Library Drive
Sault Ste. Marie, MI 49783
Janus Storey
906-632-4342
FAX: 906-635-0210
Shirley Hirschenberger, Fax Contact

LAKELAND LIBRARY COOPERATIVE
60 Library Plaza, N.E.
Grand Rapids, MI 49503
Katherine E. Davis
616-456-3647
FAX: 616-454-4517
Tat Field, Fax Contact

LIBRARY COOPERATIVE OF MACOMB
16480 Hall Road
Clinton Township, MI 48038-1140
Susan J. Hill
810-286-5750
FAX: 810-286-8951
Carolyn Pelkey, Fax Contact

MIDEASTERN MICHIGAN LIBRARY COOP.
432 North Saginaw, Suite 206
Flint, MI 48502
Sara Behrman
Email: sbehrman@nova.gmi.edu
810-232-7119
FAX: 810-232-6639

MID-MICHIGAN LIBRARY LEAGUE
411 South Lake Street, P. O. Box 700
Cadillac, MI 49601-0700
Stephen Dix
Email: dixs@mlc.lib.mi.us
616-775-6541
FAX: 616-775-1749

MID-PENINSULA LIBRARY COOPERATIVE
424 Stephenson Avenue
Iron Mountain, MI 49801
Gary L. Silver
906-774-3005
FAX: 906-774-3074
Mary Fontecchio, Fax Contact

NORTHLAND LIBRARY COOPERATIVE
316 East Chisholm Street
Alpena, MI 49707
Rebecca Erwin Cawley
517-356-1622
FAX: 517-354-3939

SOUTHWEST MICHIGAN LIBRARY COOP.
200 South Kalamazoo Street
Paw Paw, MI 49079
Alida L. Geppert
616-657-4698
FAX: 616-657-4494

SUPERIORLAND LIBRARY COOPERATIVE
1615 Presque Isle Avenue
Marquette, MI 49855
Suzanne Dees
906-228-7697
FAX: 906-228-5627

THE LIBRARY NETWORK *
33030 Van Born Road
Wayne, MI 48184
Harry R. Courtright
313-326-8910
FAX: 313-326-3035
Anne Neville, Fax Contact

WHITE PINE LIBRARY COOPERATIVE
1840 North Michigan, Suite 114
Saginaw, MI 48602-5590
Thomas L. Scott
517-754-9787
FAX: 517-754-9795
Karen Puszykowski, Fax Contact

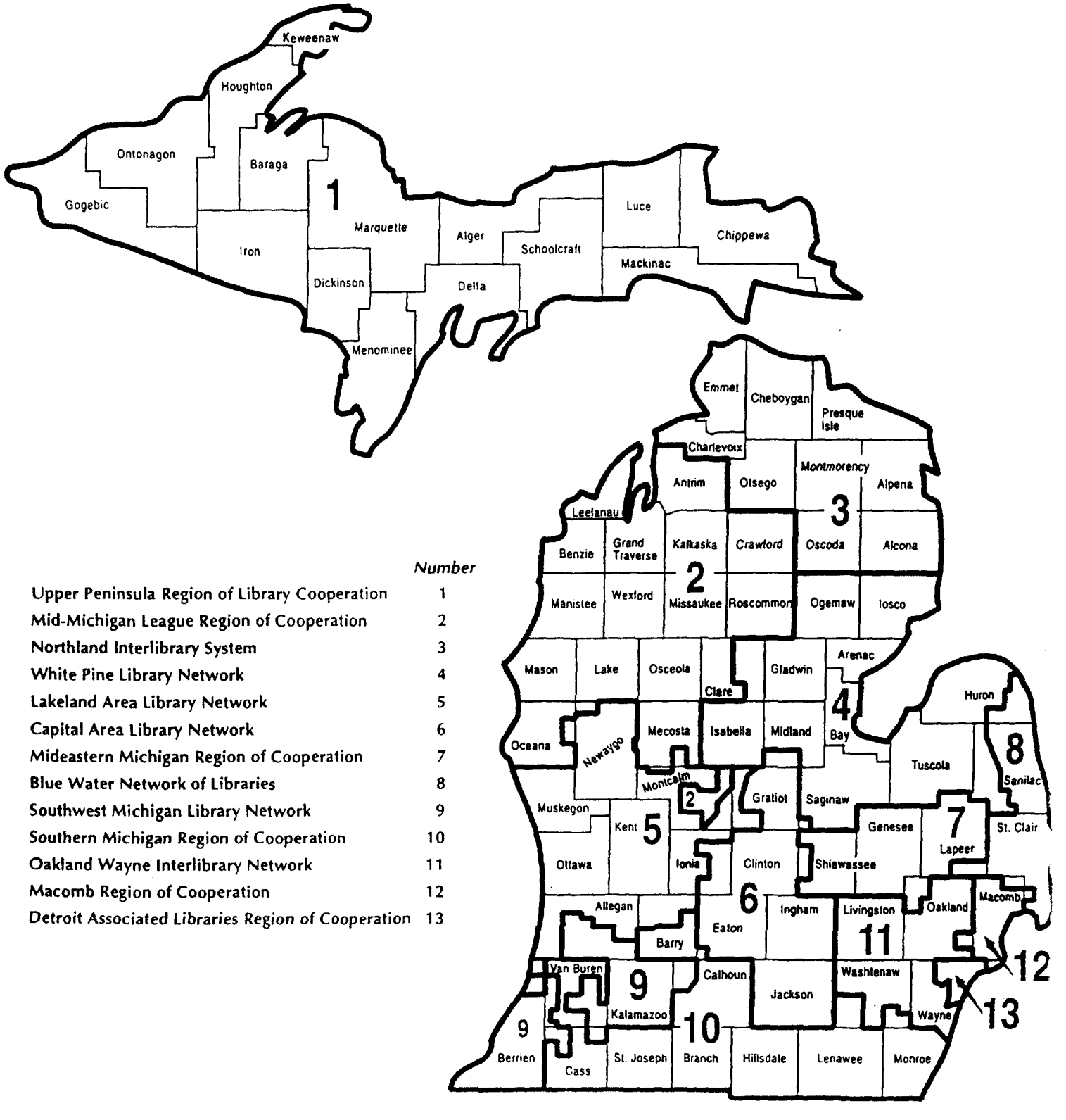
WOODLANDS LIBRARY COOPERATIVE
415 South Superior Street, Suite A
Albion, MI 49224-2135
James C. Seidl
517-629-9469
FAX: 517-629-3812

* Formerly Wayne Oakland Library Federation

Library of Michigan

Michigan's Library Regions of Cooperation

As of November 1994



	Number
Upper Peninsula Region of Library Cooperation	1
Mid-Michigan League Region of Cooperation	2
Northland Interlibrary System	3
White Pine Library Network	4
Lakeland Area Library Network	5
Capital Area Library Network	6
Mideastern Michigan Region of Cooperation	7
Blue Water Network of Libraries	8
Southwest Michigan Library Network	9
Southern Michigan Region of Cooperation	10
Oakland Wayne Interlibrary Network	11
Macomb Region of Cooperation	12
Detroit Associated Libraries Region of Cooperation	13

Michigan's Library Regions of Cooperation

As of November 1994

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Sara Behrman
Email: sbehrman@nova.gmi.edu
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FAX: 906-228-5627

WHITE PINE LIBRARY NETWORK
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Saginaw, MI 48602-5590
Thomas L. Scott
517-754-9787
FAX: 517-754-9795

Selected Bibliography for New Internet Users

Dern, Daniel P. The Internet Guide for New Users . New York: McGraw-Hill, 1994. 570 pp. ISBN 0-07-016510-6, US $40.00 (hardcover); ISBN 0-07-016511-4, US $27.95 (paper). (Dern is the former editor of Internet World magazine and author of numerous articles on the Internet in many other publications.)

Krol, Ed. The Whole Internet: User's Guide & Catalog . 2nd ed. Sebastapol, CA: O'Reilly & Associates, 1994. 543 pp. ISBN 1-56592-063-5, US $24.95. (In the fast-moving world of the Internet, for most of 1993 this was the successor to Zen as the essential guide to the Internet, and is still regarded by many as the best of the Internet books. However, the availability of other books like Gilster's makes Krol's Unix bias more evident. Recommended especially for users of Unix systems.)

LaQuey, Tracy. The Internet Companion Plus: A Beginner's Start-Up Kit for Global Networking. Reading, MA: Addison-Wesley, 1993. 196 pp. ISBN 0-201-62719-1, US $19.95. (A good guide for the true beginner, useful even for the pre-beginner who has not yet signed on to the Internet.)

The Internet Unleashed. Indianapolis: SAMS Publishing, 1994. 1,387 pp. ISBN 0-672-30466-X, US $44.95. (Contains chapters written by over 40 prominent Internet experts. This is the most comprehensive, and most expensive, Internet reference currently available, but not recommended for the beginning user).

Kehoe, Brendan. Zen and the Art of the Internet: A Beginner's Guide . 3rd ed. Englewood Cliffs, NJ: Prentice-Hall, 1994. 193 pp. ISBN 0-13-121492-6, US $23.95. (One of the first and most popular guides to the Internet. The first edition was distributed for free on the Internet, and is still available at many anonymous ftp sites, e.g. nic.merit.edu, directory /introducing.the.internet, filename zen.txt.)

Marine, April; Kirkpatric, Susan; Neou, Vivian; and Ward, Carol. Internet: Getting Started . Englewood Cliffs, NJ: PTR Prentice Hall, 1994. 360 pp. ISBN 0-13-289596-x, US $28.00. (Includes useful information on how to obtain Internet access, as well as other technical reference material.)

Ayre, Rick. "Making the Internet Connection." PC Magazine, October 11, 1994 Vol. 13 No. 17, 118+. (Good review of commercially available Internet software and online services.)

Tennant, Roy, John Ober, & Anne G. Lipow. Crossing the Internet Threshold: An Instructional Handbook . 134 pp. ISBN 1-882208-01-3, US 45.00. Berkeley, CA: Library Solutions Press, 1993. (Includes helpful fact sheets on various Internet tools from ftp and telnet to archie, gopher, WAIS, and World-Wide Web.)

Engle, Mary, Marilyn Lutz, William W. Jones, Jr., and Genevieve Engel. Internet Connections: A Librarian's Guide to Dial-Up Access and Use . Lita Monographs 3. Chicago: Library and Information Technology Association, 1993. 166 pp. ISBN 0-8389-7677-8, US $22.00.

Estrada, Susan. Connecting to the Internet: An O'Reilly Buyer's Guide . Sebastapol, CA: O'Reilly & Associates, 1993. 170 pp. ISBN 1-56592-061-9, US $15.95.

Notess, Greg R. Internet Access Providers: An International Resource Directory . Westport, CT: Meckler, 1993. ISBN 0-88736-933-2, US $22.95.

Based on: "WHERE TO START" FOR NEW INTERNET USERS
By, Jim Milles
Ver. 4.3
15 May 1994

MIN Technical Committee Report

Vol. No.

Michigan Information Network

Technical Committee

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Technical Committee Draft Paper

Table of Contents

TECHNICAL COMMITTEE DRAFT PAPER

INTRODUCTION

This report was developed to guide the state and users in the state in their purchases of network technology. Since the state is one of the largest users in the state, if the state purchases network functionalities from the market providers, the state will cause the providers to sell additional capacity on the network to others thereby broadening the community who can attach to the state governments infrastructure so the technology can become affordable for all users in the state. Additionally this should make the network more valuable to all citizens because more users can connect and communicate with more users.

There is concern that the network should not be provided free to the state or the education community by the network providers and make up the price differences from everyone else. Technical standards will be compromised if technology is provided by the infrastructure vendors at no charge, because the cost of this will be passed on to others and technology will be stifled. It was suggested that Michigan needs to allow a free market economy to weigh in on what is the most effective technology, competition should be allowed for the deployment of the technology. However there is a concern with the deployment of the new technology to the rural areas in a competitive market, policies many need to be developed to ensure that the network is extended to rural areas.

The purpose of this paper is not to rule out experimental development of voice, data or video standards. The standards for voice and data are pretty well developed, but video standards will need to be established, future standard development should not be cut off. The state will need to be a liaison between technical bodies and legislative bodies to allow for the evolutionary changes. The document is intended to provide reasonable guidance for the network to develop and evolve.

Trends

Competitive communications and convergence seem to be the trend in telecommunications policy at both the state and federal levels. In Michigan the

current communications act will sunset at the end of 1995 and parties are lining up at the legislature with their wish list for the new act. Communications services are changing both in the way the services are provided, who provides them and the way consumers will be buying them. The seven major technology trends based on surveys conducted by the Institute of Electrical and Electronic Engineers (IEEE) are (1)expansion of wireless communications like cellular and low power personal communications service (PCS) to all parts of the globe. (2)Fiber networks will be built for faster more reliable networks to allow for (3) virtual reality software and hardware along with (4)access to extensive databases at very fast speeds that will allow multimedia and distance learning to flourish. (5)Offices will become more paper less and use (6)flat panel low or no radio frequency emitions. (7)Power companies will be providing technologies that allow consumers to buy lower cost power based on user demand and demand side management technologies that uses two way communications and home monitoring systems at the same time power companies can diversify into traditional high financial return communications services.

THE INFORMATION SUPER HIGHWAY

While the information highway has been the popular success, it has received mixed reviews in terms of its usefulness. On the positive side, the phrase provides a simple visual image that is easy to grasp. The phrase has inspired numerous articals and conferences. On the down side, the term does not offer much guidance in understanding how a pervasive information infrastructure might evolve and how it will operate if there are multiple providers and no standards. Because the term is based on an analogy with physical transportation, it fails to suggest any of the distinctive new applications that the new technology will make possible. Nor does it point out the remarkable energy that is being captures by the combination of computer technology and communications. Most of all it does not point out the problems like privacy of data, need for more resources to carry the 20% per month growth, possibility of off shore investments and the effect on USA economy, corporate diversification, customer demands for reliability, universal service and prevention of redlining, and intercompany competitive battles over interconnection and monopolistic practices to name a few.

The changes in telecommunications have been a major force in the different providers in the market along with the uses by the consumer. However the formidable structure of the monopolies that exist and the failure of government to provide the incentives necessary for change (forcing monopolies to loose market share and give customers choice of providers and service) have hinder the development and full convergence of the various industries. Some of the policies *(compensation, competitive service pricing, consumer protection, monitoring, cooperation, discrimination, integration, interconnection, franchise restrictions, number portability, numbering, resale, right of way, standards, universal service, subscription, billing, unbundling, local exchange certification, collocation, provision of databases, service quality, ...)* that need change have been articulated in a number of reports, for full convergence and competition by multiple providers. The multiple provider entering the market consist of companies like telephone equipment providers, private facility carriers (fiber providers, high speed data providers and special video two way providers), long distance facility providers and resellers (over fiber, satellite or resold long distance bulk services), billing and collection providers, alternative operator service providers, customer owned coin operated telephones, cellular/personal communications or wireless providers, alternative local access providers and new power companies who sell spare capacity on their fiber facilities or cable companies who are putting in two way data and video facilities.

While convergence is no new phenomenon, it is simply a extension of the technological information society revolution that we are in and have been in for more than 40 years now. From the stand point of businesses that are affected by this revolution , virtually every business is effected. The most important consequence of this on going revolution is the way in which it is abolished the traditional limits on how companies operate. The future is going to be inhabited by a new class of worker, the global telecommuting knowledge worker. This worker will use a convergence of voice, data, video in a multimedia format to create a open market to barter trade and conduct business in light speeds around the universe. This will bring about new ways of learning, training and research that will either propel us into a world economy or create new classes of workers, those who have and those who have not the jobs, money, and power. All of this convergence of industries into communications has not made life easier for the consumer. The

buying power of the state government in this area, if done right could shape the direction of the infrastructure and make the converging technologies easier for the other consumers to use.

GOAL - FINAL OUTPUT

Section 1291 of Public Act 335 of 1993 includes language which requires that not later than June 30, 1995, the Department of Management and Budget shall prepare a state plan for the creation of a Michigan Information Network. This Network will link each local and intermediate school district, community college, independent nonprofit college or university located in this state, and state public university and each state, local or regional library on an equal basis by fiber optic, or coaxial cable, or other comparable system allowing a world-class statewide interactive video and data access and exchange system. The Michigan Information Network Planning Committee has been convened to assist the Governor's Office and Department of Management and Budget as a mechanism to ensure that education, health care providers, local and regional units of government, and others are involved in the planning process for this interactive telecommunications network.

The Michigan Information Network Planning Committee has developed a capability statement, which will be instrumental in guiding further development of this network. The mission and capabilities statement adopted by the Planning Committee is:

MISSION

The mission of the Michigan Information Network (MIN) is to ensure that Michigan has a network which integrates data, video, and voice. Such a network will allow users to connect as easily, efficiently, and cost effectively as possible to local, state, national and international networks. The network and integration function should be so robust and easy to use that each person's connection is limited only by the capability of a user's information appliance and the last mile connectivity provided.

CAPABILITIES

The systems should be responsive to an individual using an information appliance having access to a world-wide information source.

Phase I would integrate two way interactive capability including:

1. Digital video allowing full motion video

Examples: video conferencing on customer select basis, simulation of product design, interactive distance learning

2. High Speed burst data

Examples: connection to Internet, real time credit verification, real time patient verification and record retrieval, real time data base access for such uses as electronic data interchange, etc.

3. High quality voice

Phase II would integrate two way interactive capability for:

1. High quality/high resolution video

Examples: virtual reality, move video files in real time, telemedicine diagnosis, etc.

2. High speed multimedia resource data

Examples: CD ROM, product and system simulation, etc.

OPTIONS

The parts of the network that need to have standards are the customer equipment, loop-last mile, the local gateway or switch and the interswitch or intergateway

facilities. The intergateway facilities may not need any standards because there may be an adequate number of standards set like OC3, OC48, FDDI and SONET. The last mile and gateway is probably the area where the standards need to be applied and that will drive the customer equipment and customer software standards.

The gateway switching options are:

building three separate switch fabrics one for data, voice and video;

a integrated network like broad band integrated services / asynchronous transmission mode (BISDN/ATM) ; or

some other narrower bandwidth integrated network different than ATM.

While each option can be either be analog or digital, digital is the option of choice. Digital will allow for better network service quality, ability for the consumer to use the information in other digital systems and most importantly gives the ability to store and retrieve data in a automated manner that is more efficient than analog.

While there a lot of standards in the market, the gateway switching network needs to be compatible with existing facilities and allow current voice dial network calls to be handled. So the network needs to adopt the North American Dialing Standards (see appendix for standards). The gateway switching network also needs to allow Internet compatibility so the TCP/IP standards (see appendix for standards) need to be transparent and handled by the network.

The last portion of any integrated network is the video standard and there is no clear standard that is universal. The standards are under development but one thing is for certain, numerous video standards need to be accommodated that already exist like, compressed T-1, JPEG/MPEG and full motion video for tradition television. There is a need for other video standards, and video transcoders to convert from different compressions standards (protocol converters). This technology may be in both the network and possibly in the customers equipment. This equipment should be added to the gateway but available for the customers to clone if needed. Updating this technology is a problem and interoperability is important. Having the

technology centrally available would maximize availability. Consumers should have a choice in where they use this technology

The network will need to be able to carry both compressed H.320 video as well as full motion video. The network can't give the users to much bandwidth. While technology is not available today to store and retrieve video on demand, the network should develop video technology that can hold 2000 titles and 200 hours of information on demand when it is available.

The most promising option to accommodate all three services voice, data and video in a digital format, may be ATM. While ATM standards exists they are in a state of change. Since the standards are being developed and modified, there may be a ongoing need for a regular and periodic review of the standards and what is needed for Michigan. This could be done through a technical committee where standards and information can be deposited and reviewed for adoption as the standard that can be used in future network planning and design by the various users in Michigan that will form the buying power to cause the private sector to build a robust integrated digital network. Attached to this report in a appendix is a draft RFP for the development of a ATM network.

ATTACHMENTS

ATTACHMENT
Notes on Distance Dialing

This refers to the voice grade standards to be accommodated by a integrated digital network for voice, data and video. These standards should be accommodated as one of the legacy networks.

VOICE SERVICE STANDARDS REFERENCES

Reference for these standards is to the BOC Notes on the LEC Network - 1994 SR-TSV-002275

Numbering plan and dialing procedures - section 3
Network Design (for capabilities only) - section 4
Billing, Customer Data and Control - section 5
Signaling - section 6
Transmission - section 7
Operations and maintenance - section 8
Common systems - section 9
Surveillance and control - section 10
Synchronization - section 11
Distribution - section 12
Terminal equipment and premise wiring - section 13
Network architecture - section 14
Exchange access - section 15
Mobile services interconnection - section 16
ONA - section 17

ATTACHMENT
TCP/IP Standards reference

Transmission Control Protocol/ Internet Protocol (TCP/IP) is the common reference name for a collection of over 100 protocols that are used to connect computers and networks.

There will be attached at this point a bibliography of references to the TCP/IP protocols.

Appendix : ATM RFP - 1

The ATM product should accommodate all existing video protocols such as: International Telecommunications union (ITU) / International Standards Organization (ISO) H.221, ISO H.261, ISO H.320 Joint BiLevel Image Experts Group (JBIG), JPEG, Moving Pictures Experts Group (MPEG) MPEG-1, MPEG-2,

The ATM portions are included here, such as pricing, hardware, software, and support:

1.1 Customer Equipment Requirements
(See 4.2 - Desktop: for some of the questions)

2.1 Loop Requirements
(This will be controlled in part by switching hardware however discussion basically suggested a fiber based system ultimately to the desktop)

3.1 Software Interface to Customer
(Will depend on standards developed in 4.2, 5.2 and 5.3)

HARDWARE CONSIDERATIONS:

4.1 - Switching

4.1.1 - What is the rated capacity of the switches? How was that capacity determined?
4.1.2 - What is the type of switch architecture?
4.1.3 - What is the number of switching stages?
4.1.4 - What is the switch transit delay?
4.1.5 - What is the number of cell buffers?
4.1.6 - Where are the cell buffers located?
4.1.7 - What is the maximum and minimum number of ports per switch, if fully equipped?
4.1.8 - What is the lowest port speed?
4.1.9 - What is the highest port speed?
4.1.10 - What is the number of ports operating (concurrently) at high speed?
4.1.11 - Are RISC processors or ASICs used?
4.1.12 - Are hot swapable interfaces provided?
4.1.13 - Is the switching fabric redundant?
4.1.14 - List the types of LAN interfaces.
4.1.15 - Regarding power supplies and chassis:
4.1.15.1 - What are the power supplies for LAN interfaces?
4.1.15.2 - How many supplies?
4.1.15.3 - Are they loadsharing?
4.1.15.4 - Are chassis "UL" approved or provided with equivalent certification?
4.1.15.5 - Are systems/components FCC certified?
4.1.16 - Is environmental monitoring provided? Describe.
4.1.17 - Is there a limit to the number of switches that can be configured in a single network? If so, please describe.

4.2 - Desktop

4.2.1 - Are ATM adapters available for EISA, PCI bus, Microchannel, and S-bus?
4.2.2 - What is the cost of the adapters?
4.2.3 - With which vendors' switches has interoperability testing been done?